

# M o n i t o r i n g M a r i n e B i o t o x i n R e p o r t

November 2010

Technical Report No. 10-19

## INTRODUCTION:

This report provides a summary of biotoxin activity for the month of November, 2010. Ranges of toxin concentrations are provided for the paralytic shellfish poisoning (PSP) toxins and for domoic acid (DA). Estimates are also provided for the distribution and relative abundance of *Alexandrium*, the dinoflagellate that produces PSP toxins, and *Pseudo-nitzschia*, the diatom that produces domoic acid. Summary information is also provided for any quarantine or health advisory that was in effect during the reporting period.

Please note the following conventions for the phytoplankton and shellfish biotoxin distribution maps: (i) All estimates for phytoplankton relative abundance are qualitative, based on sampling effort and percent composition; (ii) All toxin data are for mussel samples, unless otherwise noted; (iii) All samples are assayed for PSP toxins; DA analyses are performed as needed (i.e., on the basis of detected blooms of the diatoms that produce DA); (iv) Please refer to the appropriate figure key for an explanation of the symbols used on the maps.

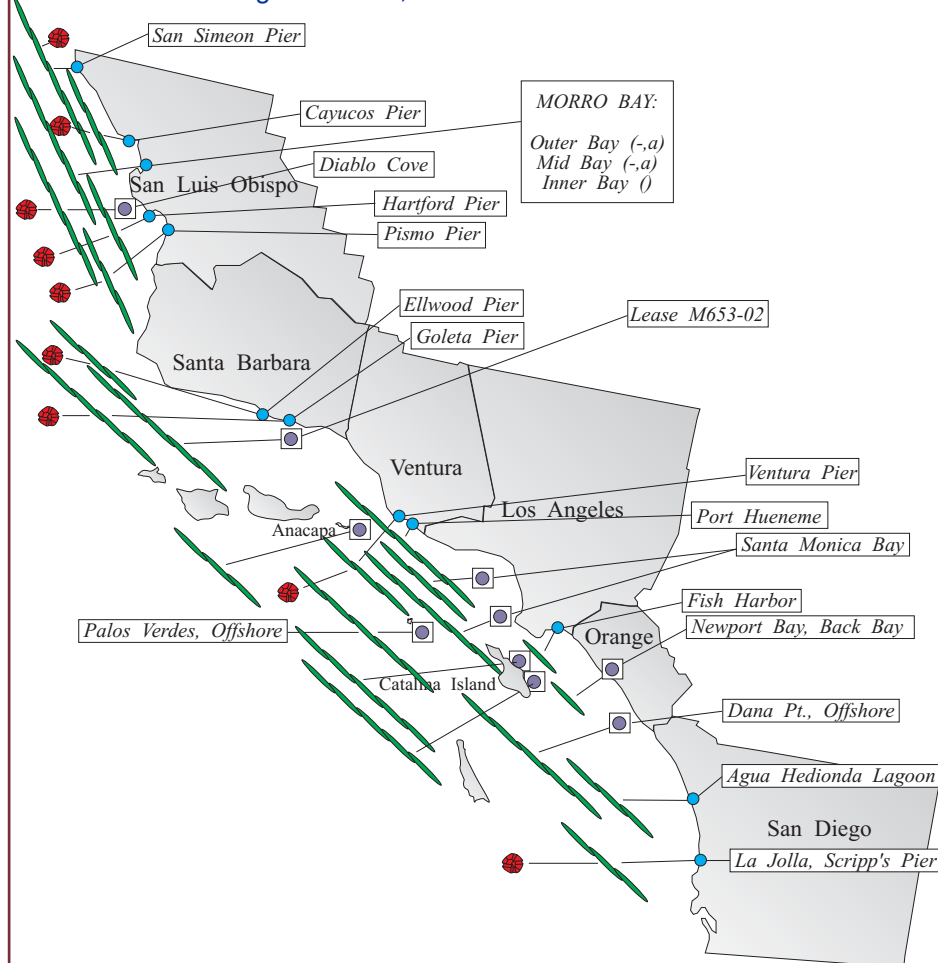
## Southern California Summary:

### Paralytic Shellfish Poisoning

Low numbers of *Alexandrium* were detected at sites between San Luis Obispo and Ventura counties and at one location in San Diego County (Figure 1). PSP toxins were not detected in any shellfish samples collected in

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Figure 1. Distribution of toxin-producing phytoplankton in Southern California during November, 2010.



## Relative Abundance of Known Toxin Producers

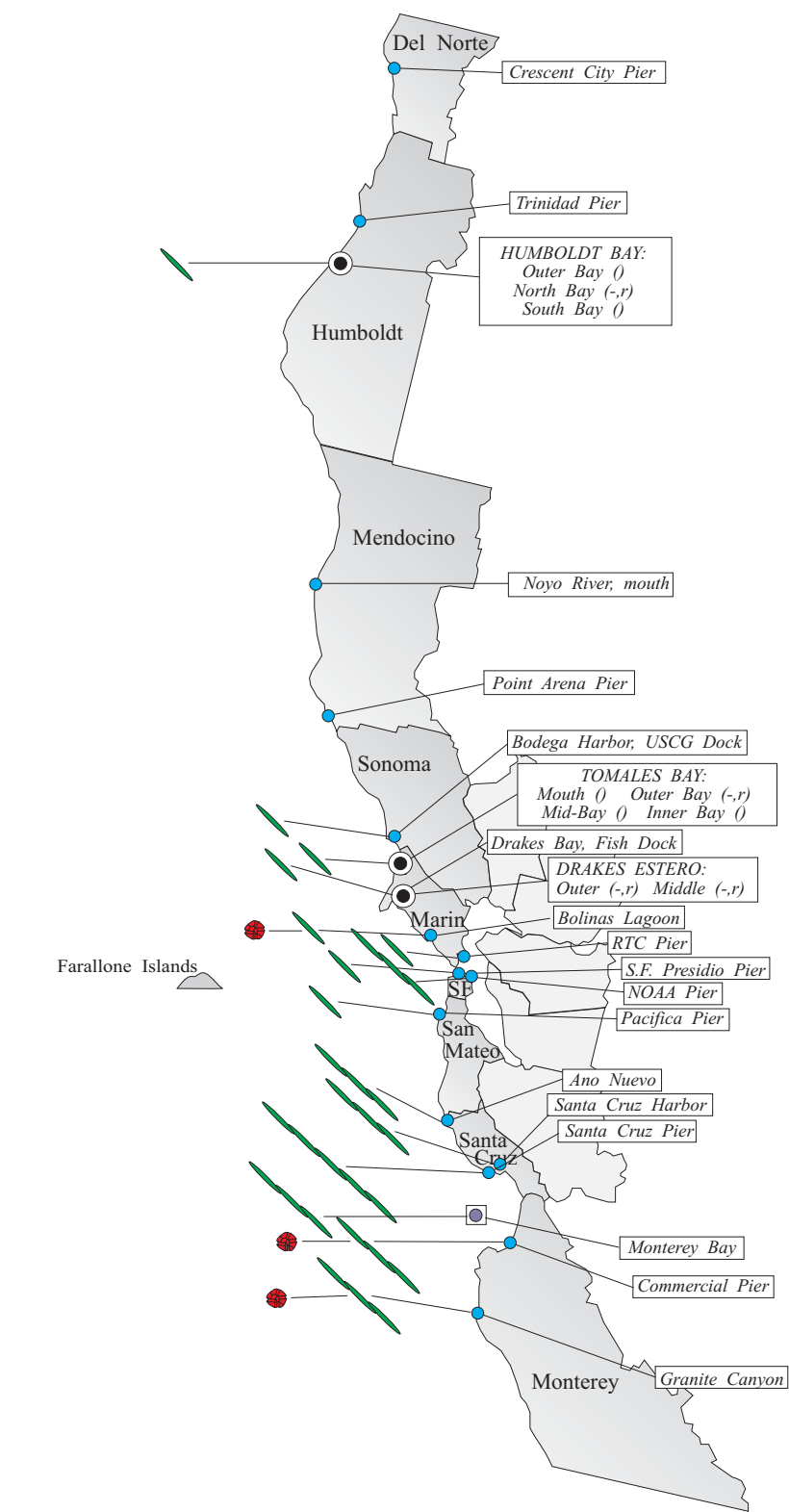
Alexandrium Species		Pseudo-nitzschia Species	
	Rare (less than 1%)		Present (less than 10%)
	Present (between 1% and 10%)		Common (between 10% and 50%)
	Common (between 10% and 50%)		Abundant (greater than 50%)
	Abundant (greater than 50%)		

## MONTHLY SAMPLING STATIONS:

- Single Sampling Station
- Multiple Sampling Stations
- Offshore Sampling Station

For areas with multiple sampling stations, species abundance at each station is represented as follows:  
(a,p) = Abundance for *Alexandrium* and *Pseudo-nitzschia*.  
e.g., (c,p) = common, present; (a,-) = abundant, not observed

Figure 2. Distribution of toxin-producing phytoplankton in Northern California during November, 2010.



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November (Figure 3).

Domoic Acid

*Pseudo-nitzschia* was abundant along the entire southern California coast during November (Figure 1). The presumed nontoxic *delicatissima* complex of *Pseudo-nitzschia* was abundant at a number of sites, with the highest relative abundances detected at Port Hueneme Pier and Santa Monica Bay. The *seriata* complex was also observed at a number of locations, with the highest relative abundances detected offshore of Diablo Cove and at an aquaculture lease offshore of Santa Barbara.

The high concentrations of domoic acid detected in samples of lobster viscera from the northern Channel Island chain in October persisted through November. The California Department of Fish and Game, in coordination with the CDPH Food and Drug Branch and Environmental Management Branch, conducted intense sampling of lobster and crab along the California coast. Elevated levels of domoic acid were detected in lobster viscera from Santa Cruz Island, with the highest concentration being 876 ppm on November 2. The majority of lobster viscera samples from the mainland region were negative for this toxin, although low levels of domoic acid were present in a few samples and concentrations above the

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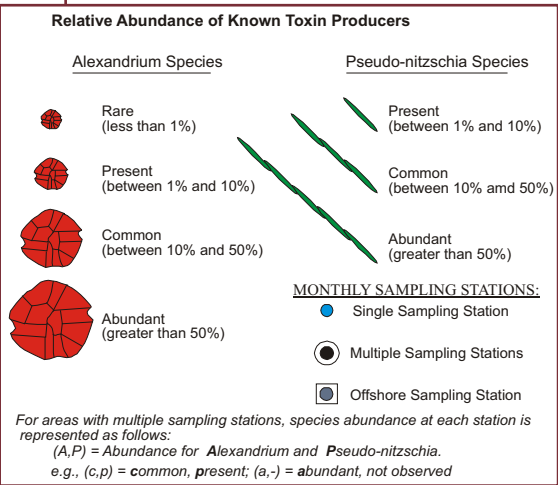
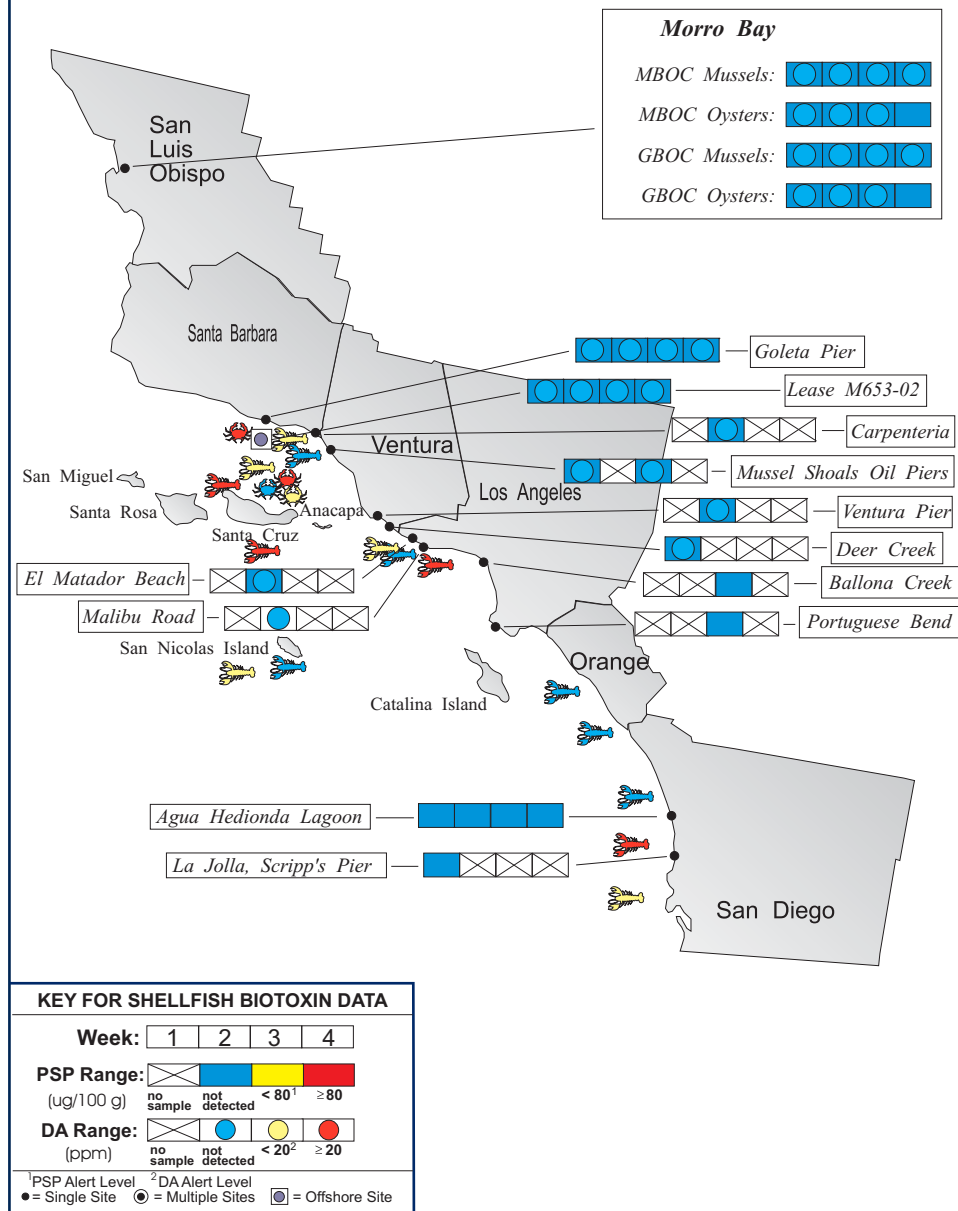


Figure 3. Distribution of shellfish biotoxins in Southern California during November, 2010.



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federal alert level were detected in single samples from Los Angeles and San Diego counties. Domoic acid was not detected in any bivalve shellfish samples during November.

#### Non-toxic Species

A mix of diatoms (*Chaetoceros*) and dinoflagellates (*Prorocentrum*, *Lingulodinium*, and *Akashiwo*) was observed at sites between San Luis Obispo and San Diego counties.

#### Northern California Summary:

#### Paralytic Shellfish Poisoning

*Alexandrium* was observed in very low numbers at several sampling sites in November (Figure 2). PSP toxins began increasing by the third week of the month at the Santa Cruz Pier, exceeding the alert level by November 24 (Figure 4).

#### Domoic Acid

*Pseudo-nitzschia* remained common to abundant at sites between San Francisco and Monterey counties (Figure 2). The highest relative abundances of *Pseudo-nitzschia* were observed at Santa Cruz Pier on November 24.

Domoic acid was absent from most samples of crab viscera. Several samples

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The Marine Biotoxin Monitoring and Control Program, managed by the California Department of Public Health, is a state-wide effort involving a consortium of volunteer participants. The shellfish sampling and analysis element of this program is intended to provide an early warning of shellfish toxicity by routinely assessing coastal resources for the presence of paralytic shellfish poisoning (PSP) toxins and domoic acid.

The Phytoplankton Monitoring Program is a state-wide effort designed to detect toxin producing species of phytoplankton in ocean water before they impact the public. The phytoplankton monitoring and observation effort can provide an advanced warning of a potential toxic bloom, allowing us to focus sampling efforts in the affected area before California's valuable shellfish resources or the public health is threatened.

For More Information Please Call:  
(510) 412-4635

For Recorded Biotoxin Information Call:  
(800) 553-4133

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contained low levels of this toxin and one sample collected offshore of San Mateo County contained an elevated level of domoic acid (Figure 4). Domoic acid was not detected in any shellfish samples analyzed during the month.

Non-toxic Species

Diatoms (*Chaetoceros* and *Skeletonema*) continued to dominate the phytoplankton assemblage in the northern counties. The dinoflagellates *Prorocentrum* and *Gonyaulax spinifera* were common between Sonoma and Monterey.



QUARANTINES:

The October 16 health advisory remained in effect, warning consumers not to eat sport-harvested shellfish or the internal organs of crustaceans and small finfish from the Channel Islands. Elevated levels of domoic acid were first detected in the viscera of lobster in this region and subsequently in rock crab viscera.

The annual mussel quarantine ended at midnight on October 31, with the exception of the health advisory issued for the Channel Islands. When in effect, this quarantine prohibits the sport-harvesting of mussels along the entire California coastline, including all bays and estuaries. The annual quarantine does not apply to the certified commercial shellfish growing areas in California, which are monitored intensively throughout the year. All certified shellfish growers are required to submit at least weekly samples of shellfish for toxin monitoring. Harvest restrictions or closures are implemented as needed to protect the public's health. In addition, routine coastal phytoplankton and biotoxin monitoring is maintained

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Figure 4. Distribution of shellfish biotoxins in Northern California during November, 2010.

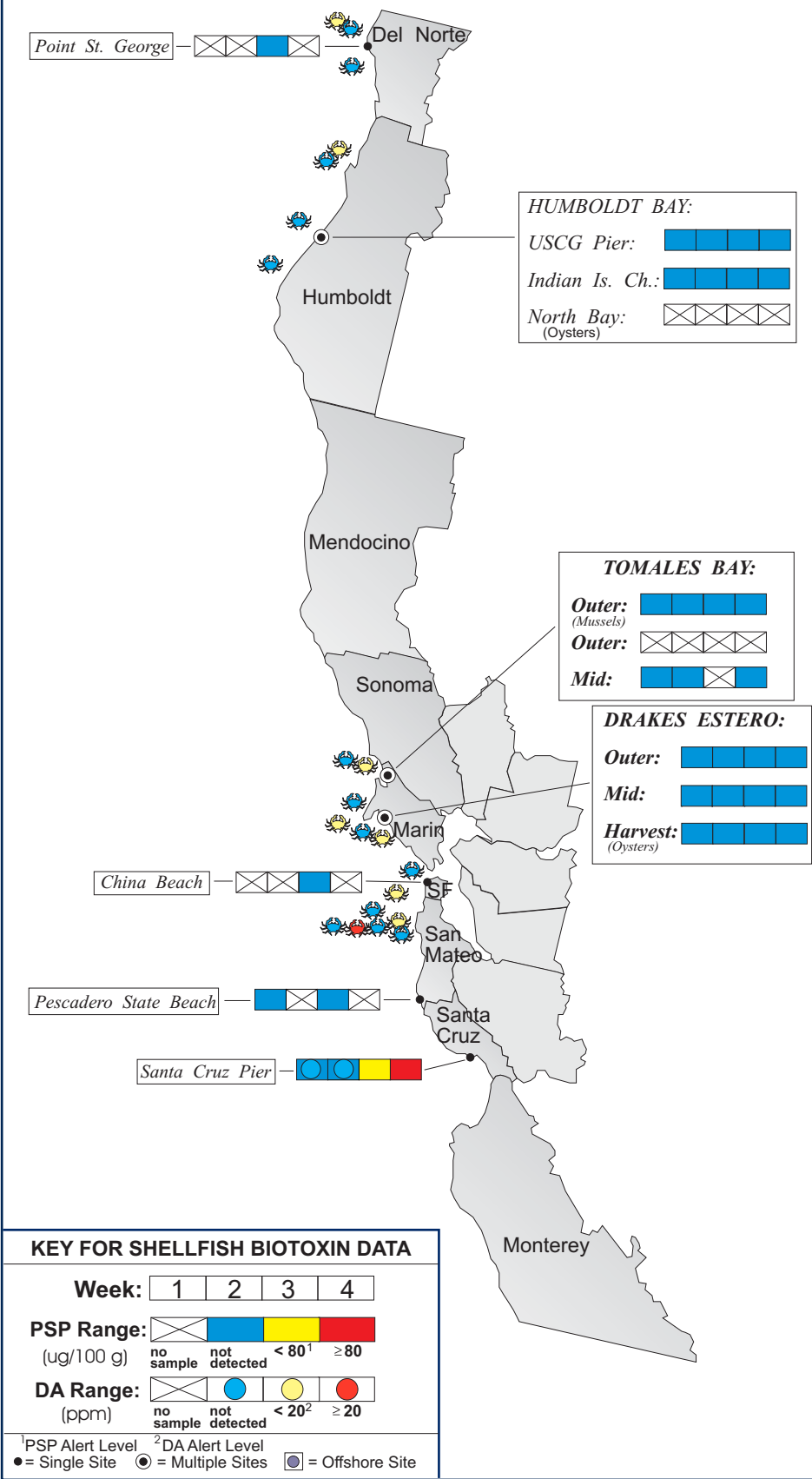


Table 1. California Marine Biotoxin Monitoring Program participants submitting shellfish samples during November, 2010.

COUNTY	AGENCY	# SAMPLES
Del Norte	Del Norte County Health Department	1
	Department of Fish and Game; Food and Drug Branch	18
Humboldt	Coast Seafood Company	10
	Department of Fish and Game; Food and Drug Branch	24
Mendocino	None Submitted	
Sonoma	Department of Fish and Game; Food and Drug Branch	37
Marin	Cove Mussel Company	3
	Drakes Bay Oyster Company	20
	Hog Island Oyster Company	5
	Department of Fish and Game; Food and Drug Branch	37
San Francisco	San Francisco County Health Department	1
	Department of Fish and Game; Food and Drug Branch	18
San Mateo	San Mateo County Environmental Health Department	2
	Department of Fish and Game; Food and Drug Branch	18
Santa Cruz	U.C. Santa Cruz	4
Monterey	None Submitted	
San Luis Obispo	Grassy Bar Oyster Co.	10
	Morro Bay Oyster Company	8
Santa Barbara	Santa Barbara Mariculture Company	10
	U.C. Santa Barbara	4
	Department of Fish and Game; Food and Drug Branch	7
Ventura	Ventura County Environmental Health Department	4
	Coastal Marine Biolabs	1
	California Department of Fish and Game	1
Los Angeles	Los Angeles County Health Department	2
	Department of Fish and Game; Food and Drug Branch	14
Orange	Department of Fish and Game; Food and Drug Branch	2
San Diego	Carlsbad Aquafarms, Inc.	5
	Scripps Institute of Oceanography	1
	Department of Fish and Game; Food and Drug Branch	3

Persons taking scallops or clams, with the exception of razor clams, are advised to remove and discard the dark parts (i.e., the digestive organs or viscera). Razor clams (*Siliqua patula*) are an exception to this general guidance due to their ability to concentrate and retain domoic acid in the edible white meat as well as in the viscera.

PSP toxins affect the human central nervous system, producing a tingling around the mouth and fingertips within a few minutes to a few hours after eating toxic shellfish. These symptoms typically are followed by disturbed balance, lack of muscular coordination, slurred speech and difficulty swallowing. In severe poisonings, complete muscular paralysis and death from asphyxiation can occur.

Symptoms of domoic acid poisoning can occur within 30 minutes to 24 hours after eating toxic seafood. In mild cases, symptoms of exposure to this nerve toxin may include vomiting, diarrhea, abdominal cramps, headache and dizziness. These symptoms disappear completely within several days. In severe cases, the victim may experience excessive bronchial secretions, difficulty breathing, confusion, disorientation, cardiovascular instability, seizures, permanent loss of short-term memory, coma and death.

Any person experiencing any of these symptoms should seek immediate medical care. Consumers are also advised that neither cooking or freezing eliminates domoic acid or the PSP toxins from the shellfish tissue. These toxins may also accumulate in the viscera of other seafood species such as crab, lobster, and small finfish like sardines and anchovies, therefore these tissues should not be consumed. Contact the "Biotoxin Information Line" at 1-800-553-4133 for a current update on marine biotoxin activity prior to gathering and consuming shellfish.

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throughout the quarantine period. Special quarantines or health advisories may be issued for additional seafood species as warranted by increasing toxin levels.

Consumers of Washington clams, also

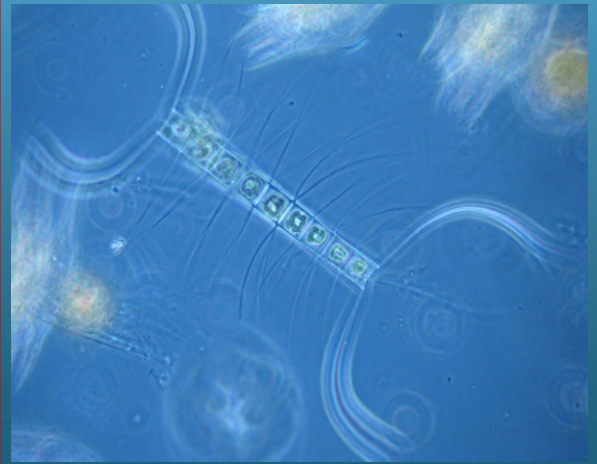
known as butter clams (*Saxidomus nuttalli*), are cautioned to eat only the white meat. Washington clams can concentrate the PSP toxins in the viscera and in the dark parts of the siphon and can remain toxic for a long period of time.



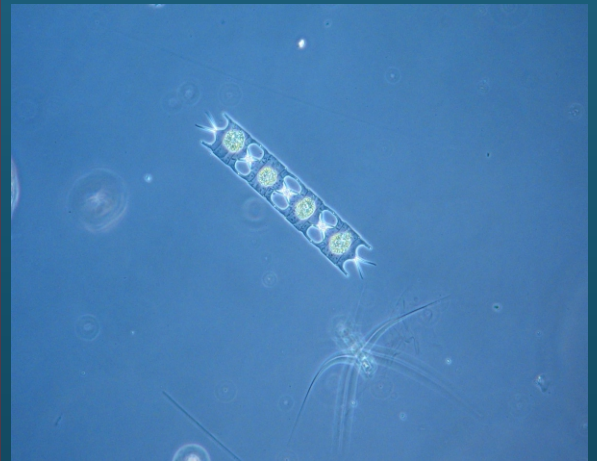
Table 2. Agencies, organizations and volunteers participating in marine phytoplankton sample collection during November, 2010.

COUNTY	AGENCY	# SAMPLES
Del Norte	Del Norte County Health Department	3
Humboldt	Coast Seafood Company	5
	Humboldt State University Marine Lab	1
Mendocino	California Department of Fish and Game	1
	CDPH Volunteer ( <i>Marie De Santis</i> )	2
Sonoma	CDPH Volunteer ( <i>Cathleen Cannon</i> )	1
Marin	CDPH Volunteer ( <i>Brent Anderson</i> )	5
	Drakes Bay Oyster Company	13
	Hog Island Oyster Company	1
	SFSU, Romberg Tiburon Center	5
San Francisco	CDPH Volunteer ( <i>Eugenia McNaughton</i> )	1
	San Francisco Health Department	4
San Mateo	The Marine Mammal Center ( <i>Stan Jensen</i> )	4
	San Mateo County Environmental Health Dept.	2
	U.C. Santa Cruz	1
Santa Cruz	San Lorenzo Valley High School	2
	U.C. Santa Cruz	4
Monterey	Monterey Abalone Company	3
	Marine Life Studies	1
	Marine Pollution Studies Laboratory	3
San Luis Obispo	Friends of the Sea Otter ( <i>Kelly Cherry</i> )	5
	Morro Bay National Estuary Program	1
	Monterey Bay National Marine Sanctuary	2
	Morro Bay Oyster Company	1
	Tenera Environmental	3
	The Marine Mammal Center ( <i>Tim Lytsell, P.J. Webb</i> )	8
Santa Barbara	CDPH Volunteer ( <i>Sylvia Short</i> )	5
	Santa Barbara Mariculture Company	5
	U.C. Santa Barbara	4
Ventura	CDPH Volunteer ( <i>Fred Burgess</i> )	4
	Coastal Marine Biolabs	2
	National Park Service	2
	Ventura County Environmental Health Department	2
Los Angeles	City of Los Angeles Environmental Monitoring Div.	3
	Los Angeles County Sanitation District	3
	Southern California Marine Institute	1
	Guided Discoveries, Tole Mour	3
Orange	California Department of Fish and Game	5
	Ocean Institute	2
San Diego	Carlsbad Aquafarms, Inc.	4
	Scripps Institute of Oceanography	5

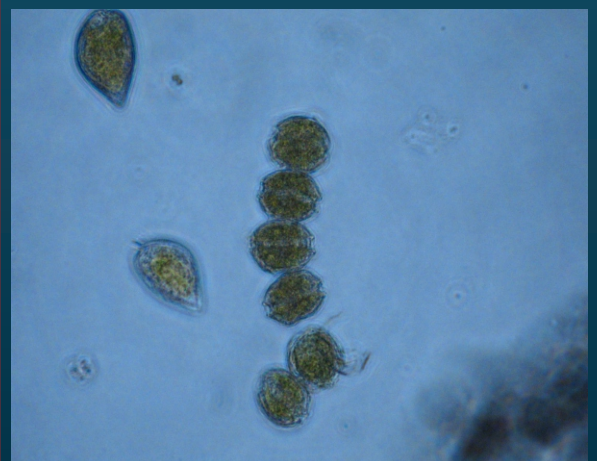
## PHYTOPLANKTON GALLERY



The diatom *Chaetoceros* was common at a number of locations along the California coast.



A chain of the diatom *Odontella*, which is often present in low numbers.



Two- and four-celled chains of the dinoflagellate *Alexandrium*, the PSP toxin producer.